

WHAT IS CLAIMED IS:

1. A method for controlling a power spectral density (PSD) of a plurality of radio frequency (RF) signals output from a corresponding plurality of RF systems disposed on a corresponding plurality of independent mobile platforms operating within a given geographical coverage region, wherein the RF systems are transmitting RF signals
5 simultaneously to a shared space-based RF transponder, to thus maintain an aggregate PSD of said RF signals within a predetermined regulatory PSD limit, the method comprising the steps of:

a) determining said PSD of said RF signals to be transmitted by each said RF system of each said mobile platform prior to said transmission of said RF signals
10 from each said RF system;

b) summing said PSD of said RF signals from each said RF system to determine said aggregate PSD;

c) comparing said aggregate PSD to said predetermined regulatory PSD limit; and

15 d) authorizing transmissions by each of said RF systems only if said aggregate PSD is within said regulatory limit.

2. The method of claim 1, further comprising the step of performing steps a) through d) by a central, ground-based controller.

3. The method of claim 2, further comprising the step of:
requiring each of said mobile systems to transmit a request for authorization to transmit before transmitting said RF signals from its associated said RF system.

4. The method of claim 1, further comprising the step of causing said mobile systems to transmit a request for authorization to transmit at a particular transmit power.

5. The method of claim 4, further comprising the step of making said transmit power proportional to a data rate at which said RF signal is transmitted.

6. The method of claim 5 further setting said transmit data rate equal to a demand for data rate on said mobile platform.

7. The method of claim 1, further comprising the step of:
causing said mobile systems to transmit requests for authorization to transmit spontaneously, at any time, according to demand for service on said mobile platform.

8. The method of claim 2, further comprising the steps of:

informing said central controller when each said mobile system decides to decrease its transmit power; and

wherein said central controller subtracts said corresponding PSD reduction

5 from said aggregate PSD.

9. The method of claim 8, wherein said decrease in transmit power corresponds to a reduction in a transmit data rate of said RF signal.

10. The method of claim 9, wherein said reduction in said transmit data rate corresponds to a reduction in data rate demand on said mobile platform.

11. The method of claim 2, further comprising the step of:
using said central, ground-based controller to poll each of said RF systems that are not currently transmitting for said requests for authorization.

12. The method of claim 2, further using said central, ground based controller to cause to reduce or turn off the transmit power of any one of said mobile systems at any time after previously giving authorization to transmit to said mobile systems if said aggregate PSD approaches within a predetermined margin of said regulatory PSD
5 limit.

13. The method of claim 1, wherein the step of determining said PSD of said RF signal to be transmitted by each said mobile systems comprises the steps of:

determining a location of said mobile platform;

determining a heading and attitude of said mobile platform;

5 determining a location of said space-based RF transponder;

determining a type of antenna being used by said mobile platform to transmit said RF signals from its said RF system; and

considering a requested transmit power of said RF system.

14. The method of claim 13, further including the step of reporting said location and attitude to said central controller during said request for authorization to transmit, and said central controller using said location and attitude to calculate said PSD contribution.

15. The method of claim 10 wherein said location and attitude is reported to said central controller on a predetermined time schedule so that said mobile system PSD contribution is monitored as said mobile system moves within said coverage region.

16. The method of claim 2, further comprising the step of causing each said RF system to spread its said RF signal in frequency over a predetermined bandwidth

18. The method of claim 17, further comprising the step of using said central controller to assign a unique one of said pseudo noise spreading codes to each of said mobile systems.

19. A method for controlling a power spectral density (PSD) of a plurality of radio frequency (RF) signals output from a corresponding plurality of RF systems disposed on a corresponding plurality of independent mobile platforms operating within a given geographical coverage region, wherein the RF systems are transmitting
5 RF signals simultaneously to a space-based RF transponder, to thus maintain an aggregate PSD of said RF signals within a predetermined regulatory PSD limit, the method comprising the steps of:

- a) determining a location of each said mobile platform;
- b) determining a location of said space-based RF transponder;
- 10 c) determining a type of antenna disposed on each mobile platform which is transmitting said RF signals;
- d) determining a transmit power of said RF system;
- e) spreading said RF signals from each of said RF systems over a predetermined bandwidth;
- 15 f) using a central controller to determine, from the information of steps a) through d), what said aggregate PSD is for said RF signals being transmitted from all of said RF systems;
- g) comparing said aggregate PSD with said predetermined regulatory PSD limit; and
- 20 f) using said central controller to control transmissions from each of said mobile platforms to ensure that said aggregate PSD of said RF signals does not exceed said regulatory PSD limit.

causing each said mobile platform to transmit a request for authorization to transmit to said space-based RF transponder prior to transmitting said RF signals from its associated said RF system, said request for authorization comprising information relating to a data rate at which said RF system will be transmitting

22. The method of claim 19, further causing said central controller to instruct at least one of said mobile platforms to reduce a rate of data transmission of its said RF signals, while said one mobile platform's said RF system is transmitting, if said central controller detects that said regulatory PSD limit is to be exceeded.

48

24. The method of claim 19, further comprising the step of requiring each said mobile system to transmit a request for authorization to transmit at a particular transmit power.

25. The method of claim 19, further comprising the step of requiring each of said mobile systems to transmit a signal to said central controller to inform said central controller when it will be decreasing the transmit power of its associated said RF system.

26. The method of claim 26, further comprising the step of using said central controller to adjust said aggregate PSD to reflect additional PSD capacity gained whenever anyone of said mobile systems informs said central controller that it has decreased its transmit power.

27. A method for managing radio frequency (RF) transmissions from RF systems of a plurality of mobile platforms operating within a predetermined coverage region to a space-based transponder orbiting within said coverage region, in a manner to maintain an aggregate power spectral density (PSD) of said RF transmissions within a predetermined regulatory PSD limit, said method comprising
5 the steps of:

causing a first one of said mobile platforms to transmit a request for authorization to transmit signal indicating a transmit power which said first mobile platform wishes to use to transmit subsequent information an RF transmitter on-
10 board said first mobile platform;

using a central controller to receive said request for authorization to transmit signal and to add said transmit power to an aggregate PSD value;

using said central controller to authorize said first mobile platform to use said transmit power to transmit said subsequent information provided that said aggregate
15 PSD value does not exceed said regulatory PSD limit;

causing said first one of said mobile platforms to periodically provide information concerning a location of said mobile platform to said central controller;
and

using said central controller to terminate RF transmissions from said first
20 mobile platform at any time if said regulatory PSD limit is expected to be exceeded.

29. The method of claim 27, further comprising the step of spreading the frequency of signals transmitted by said RF transmitter of said first mobile system.

30. The method of claim 29, further comprising the step of using said central controller to assign a unique spreading code to said first mobile system.

51